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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,306	07/30/2001	Jun Koyama	12732-059001	8263

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EXAMINER

EISEN, ALEXANDER

ART UNIT	PAPER NUMBER
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2674

DATE MAILED: 04/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,306

Applicant(s)

KOYAMA, JUN

Examiner

Alexander Eisen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 46-57 is/are allowed.
- 6) ☒ Claim(s) 1-45 and 58-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The objection to claim 21 and rejection of claims 51 and 55 under USC 112(2) as being indefinite are withdrawn necessitated by Applicant's amendment.

Claim Objections

2. Claim 54 is objected to because of the following informalities: in the last line "transistor, and" should read -- transistor.--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 11, 14 and 58 are rejected under 35 U.S.C. 102(e) as being anticipate by Perner, US 6,115,019 (reference supplied by the applicant in IDS, paper #11).

With respect to claim 11 Perner discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells (col. 2, lines 69-53) within each pixel and comprising $n \times m$ (at least 12, and also can be 18 or 24) storage circuits 10 (FIG. 1) for storing at least three frames (red, green and blue frames; number of frames $m = 3$; see col. 4; lines 52-67) of an n -bit ($n = 6$) digital image signal (n is an integer and $m \geq 2$); a write-in storage circuit selection portion electrically connected to a selected one of the $n \times m$ storage circuits (write word line 14; see col. 4, lines 23-28; col. 8, lines 48-53),

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the write-in storage circuit, as it is shown in FIG. 1, has three wires $wwl[0:2]$ for controlling (selecting one) an access to three different groups of 6-bit memories in order to input 6-bit data from write bit line 12 ($wbl[0:5]$); a read storage circuit selection portion (18 and 22) electrically connected to a selected one of the $n \times m$ storage circuits 34 (six selecting wires 18 for reading grayscale 6-bit information and three selecting wires for reading color information); a write-in transistor 32 electrically connected to the write-in storage circuit selection portion 14; a read transistor (36 and 38) electrically connected to the read storage circuit selection portion 18 and 22; and a liquid crystal element 100 (FIG. 2; col. 5, line 67 - col. 6, line 17) electrically connected to the read transistor (36, 38).

As to claim 14, Perner teaches that the storage is a DRAM type of memory (col. 3, lines 3-12).

As to claim 58, $m = 3$, i.e. $m > 1$.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 4, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al., ("Okumura"), US 5,945,972 (reference of record cited but not relied upon by the examiner in the previous Office action) in view of Perner.

With respect to claim 1 Okumura discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels comprises a plurality of storage circuits (230a

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and 230b; FIGS. 6-9); a write-in storage circuit selection portion (inverter 231, transfer gates 232a and 233a, switch signal 261) connected to a selected one of the plurality of storage circuits (for example, when the switch signal 261 is low transfer gate 233a is ON and an image signal 275 is applied to the memory cell 230b; see col. 18, lines 7-42); a read storage circuit selection portion (232b and 233b) electrically connected to a selected one of the plurality of storage circuits.

Okumura does not disclose that the plurality of pixels respectively comprise a write-in transistor electrically connected to the write-in storage circuit selection portion, a read transistor electrically connected to the read storage circuit selection portion and a liquid crystal element electrically connected to the read transistor. Perner teaches a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and having a write-in transistor 32 electrically connected to the write-in storage circuit selection portion 14; a read transistor (36 and 38) electrically connected to the read storage circuit selection portion 18 and 22; and a liquid crystal element 100 (FIG. 2; col. 5, line 67 - col. 6, line 17) electrically connected to the read transistor (36, 38). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to improve the memory cell arrangement of Okumura by adding to it the write-in transistor electrically connected to the write-in storage circuit selection portion and the read transistor electrically connected to the read storage circuit selection portion, as taught by Perner, because it would allow the independent writing and reading operations, which in turn enables slow input data rate to match a variety of host systems and minimize flickers and artifacts (see Perner, col. 5, lines 1-10).

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As to claims 2 and 4, Okumura teaches using SRAM and DRAM memory (see FIGS. 8-9; col. 18, lines 22-42).

As to claim 4, Perner teaches using DRAM memory circuits in each pixel.

In regard to claims 9 and 10, Perner teaches a laptop (personal PC) computer using LCD display (col. 8, lines 35-47). Even though Perner does not specifically teach that the LCD can be also used in such devices as television, a portable terminal, a video camera or a head mount display it would have been known to one of ordinary skill in the art at the time when the invention was made that LCD devices are commonly used in a broad spectrum of electronic devices, including those mentioned above.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura in view of Perner and further in view of Yamazaki (reference of record, IDS).

Okumura discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels comprises a plurality of storage circuits.

Perner teaches a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and having a write-in transistor; a read transistor; and a liquid crystal element electrically connected to the read transistor. None of the above discloses ferroelectric memory that can be used in the storage circuits. Yamazaki teaches a storage circuit for LCD employing ferroelectric type of memory. It would have been obvious to one of ordinary skill in the art at the time when the invention was made that the memory taught by Yamazaki can be applied for the storage devices of Okumura-Perner, because it would allow to provide a display capable of rewriting only specified pixels as taught by Yamazaki, resulting in saving power, and also realize "resume" function, which stores

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the image at turning power off and restores it upon turning power back on (Yamazaki; col. 5, lines 42-50).

8. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura in view of Perner and further in view of Fonash et al., ("Fonash"), US 5,945,866.

Okumura discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels comprises a plurality of storage circuits. Perner teaches a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and having a write-in transistor; a read transistor; and a liquid crystal element electrically connected to the read transistor. None of the above teaches that the storage circuits can be formed on a glass or a plastic substrate. Fonash teaches that the circuit of LCD can be made on either glass or plastic substrates (FIG.1; col. 1, lines 44-52). It would have been obvious to one of ordinary skill in the art at the time when the invention was made that either substrate, glass and plastic, as taught by Fonash, can be used for manufacturing the storage circuits of Okumura-Perner, which will be readily recognized by those of ordinary skilled in the art at the time of the invention as an alternative material choice for manufacturing, without bringing any unexpected result. It also should be pointed out that neither Fonash nor applicant show any criticality of the choice or advantage of using one type of a substrate over another.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura in view of Perner and further in view of Johnson, US 4,752,118.

Okumura discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels comprises a plurality of storage circuits. Perner teaches a liquid crystal

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display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and having a write-in transistor; a read transistor; and a liquid crystal element electrically connected to the read transistor. None of the above teaches that the components of LCD can be manufactured using stainless steel substrate. Johnson teaches that the semiconductor circuits, including those for LCD, can be made using stainless steel substrates. It would have been obvious to one of ordinary skill in the art at the time when the invention was made that any known type of a substrate, stainless steel substrate taught by Johnson including, can be used for manufacturing the memory circuit of liquid crystal display device of Okumura-Perner, and it would be readily recognized by those of ordinary skilled in the art as an alternative choice for manufacturing, without requiring unduly experimentation or bringing unexpected result.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura in view of Perner and further in view of Kobayashi et al., ("Kobayashi"), US 4,432,610.

Okumura discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels comprises a plurality of storage circuits. Perner teaches a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and having a write-in transistor; a read transistor; and a liquid crystal element electrically connected to the read transistor. Okumura and Perner do not teach or suggest, individually or in combination, that the storage circuits are formed on monocrystalline wafer substrate. Kobayashi teaches that the memory circuit for LCD can be made on monocrystalline wafer substrate (col. 5, lines 13-21 and FIG. 4). It would have been obvious to one of ordinary skill in the art at the time when the invention was made that the

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teachings of Kobayashi will complement the teachings of Okumura and Perner by providing a concrete realization of how the memory circuits for Okumura-Perner display can be manufactured using a monocrystalline wafer substrate.

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perner in view of Okumura.

Perner discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and comprising $n \times m$ storage circuits. Perner does not disclose that a SRAM type of memory can be used as the storage circuits. Okumura teaches a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels comprises a plurality of storage circuits, which can be of both DRAM and SRAM type of memory. It would have been obvious to one of ordinary skill in the art at the time when the invention was made to use SRAM type of memory taught by Okumura in the display device of Perner, because it would advantageously allow to transfer image data from the host system and write it into a memory only when the display image is needed to be updated and therefore to reduce transmission power and noise (Okumura; col.18, 37-43, lines 50-54).

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perner in view of Yamazaki et al., ("Yamazaki"), US 5,349,366 (IDS).

Perner discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and comprising $n \times m$ storage circuits. Perner does not disclose that ferroelectric memory can be used as the storage circuits. Yamazaki teaches a storage circuit for LCD employing ferroelectric type of

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memory. It would have been obvious to one of ordinary skill in the art at the time when the invention was made that the memory taught by Yamazaki can be applied for the storage devices of Perner, because it would allow rewriting only specified pixels as taught by Yamazaki and provide the display with "resume" function (Yamazaki; col. 5, lines 42-50).

13. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perner in view of Fonash.

Perner discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and comprising $n \times m$ storage circuits. Perner does not disclose that the storage circuits can be formed on a glass or a plastic substrate. Fonash teaches that the circuit of LCD can be made on either glass or plastic substrates (FIG.1; col. 1, lines 44-52). It would have been obvious to one of ordinary skill in the art at the time when the invention was made that either substrate, glass and plastic, as taught by Fonash, can be used for manufacturing the storage circuits of Perner, and this will be readily recognized by those of ordinary skilled in the art at the time of the invention as an alternative material choice for manufacturing a substrate. It also should be pointed out that neither Fonash nor applicant show any criticality of the choice or advantage of using one type of a substrate over another.

14. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perner in view of Johnson.

Perner discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and comprising $n \times m$ storage circuits. Perner does not teach that the components of LCD can be manufactured

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using stainless steel substrate. Johnson teaches that the semiconductor circuits, including those for LCD, can be made using stainless steel substrates. It would have been obvious to one of ordinary skill in the art at the time when the invention was made that any known type of substrate, stainless steel taught by Johnson including, can be used for manufacturing the memory circuit of liquid crystal display device of Perner, it would be readily recognized by those ordinary skilled in the art as an alternative choice of a substrate material for manufacturing the storage circuits.

15. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perner in view of Kobayashi.

Perner discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and comprising $n \times m$ storage circuits. Perner does not teach that a monocrystalline wafer substrate can be also used for forming the storage circuits thereon. Kobayashi teaches that the memory circuit for LCD can be made on monocrystalline wafer substrate (col. 5, lines 13-21 and FIG. 4). It would have been obvious to one of ordinary skill in the art at the time when the invention was made that the teachings of Kobayashi will complement the teachings of Perner by providing a concrete realization of how the memory circuits for Perner display can be manufactured using a monocrystalline wafer substrate.

16. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perner.

Perner discloses a liquid crystal display device having a plurality of pixels, wherein the plurality of pixels respectively include integrated memory cells within each pixel and comprising $n \times m$ storage circuits. Perner also disclose using LCD in the personal computer. Even though

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Perner does not specifically teach using the LCD in such devices as television, a portable terminal, a video camera or a head mount display it would have been obvious to one of ordinary skill in the art at the time when the invention was made that LCD devices are commonly used in a broad spectrum of electronic devices, including those mentioned above.

Double Patenting

17. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

18. Claims 21-45 and 59-60 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 3-5, 8-13 of copending Application No. 09/912,596. Although the conflicting claims are not identical, they are not patentably distinct from each other because, even though claims 21 and 33 of the current application are directed to LCD pixel-memory structure and claims 3 and 4 of copending application – to EL type of light-emitting display, the corresponding structures and functionality of their elements are exactly the same, and it would have been obvious to one of ordinary skill in the art at the time when the invention was made that similar element composition and functionality can be applied to any type of known matrix type of a display, the structure being

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structure being in fact independent from the display type. It should be noted that claims 8-13 have been cancelled by amendment and subject matter of these claims is currently represented by dependent claims 24-30 and 33-45. Accordingly, claims 22 and 34 of the application correspond to claim 5, claims 23 and 35-36 to claim 6, claims 24 and 37 to claims 22-23, claims 25 and 38 to claims 25-26, claims 26 and 39 to claims 28-29, claims 27-30 and 40-43 to claims 31-32, claims 31-32 and 44-45 to claims 37-38, and claims 58-59 to claims 44-45 of copending application respectively.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Allowable Subject Matter

19. Claims 46-53 are allowed.

20. Claims 54-57 would be allowable, given that the minor informality in objected claim 54 is corrected (item 2 of present Office action).

21. The following is an examiner's statement of reasons for allowance: none of the references, either individually or in combination, teach or fairly suggest a method of driving a liquid crystal display device comprising steps as claimed in independent claims 46, 50 and 54, and particularly the step of outputting the n ($n \geq 2$) bit digital image signal from the latch circuit into a source signal line, selecting a gate signal line in accordance with a gate signal line selection pulse, as required by claim 46, or selecting a gate signal line sequentially from the first row in accordance with a gate signal line selection pulse, as required by claim 50, or selecting a gate signal line arbitrary in accordance with a gate line selection pulse, as required by claim 54; inputting the n bit digital image signal from the source signal line to a plurality of pixels in a row

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where the gate signal line is selected; selecting a storage circuit in the plurality of pixel; writing the n bit digital image signal into the storage circuit via a write-in transistor; and performing the n bit digital image signal read from the storage circuit via read transistor.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments with respect to claims 1-20 and 58 have been considered but they are directed to the claims as amended and therefore are moot in view of the new ground(s) of rejection. No terminal disclaimer or arguments have been filed in response to the provisional obviousness-type double patenting rejection and therefore the rejection of claims 21-45 and 59-60 is maintained.

Conclusion

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Eisen whose telephone number is (703) 306-2988. The examiner can normally be reached on M-F (8:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard A. Hjerpe can be reached on (703) 305-4709.

Any response to this action should be **mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or **faxed to:**

(703) 872-9306 (for Technology Center 2600 only).

Hand-delivered responses should be **brought to:** Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia, Sixth Floor Receptionist.

Any inquiry of a general nature or relating to the status of this application or proceeding should be **directed to:** Technology Center 2600 Customer Service Office, whose telephone number is (703) 306-0377.



Alexander Eisen
April 27, 2004